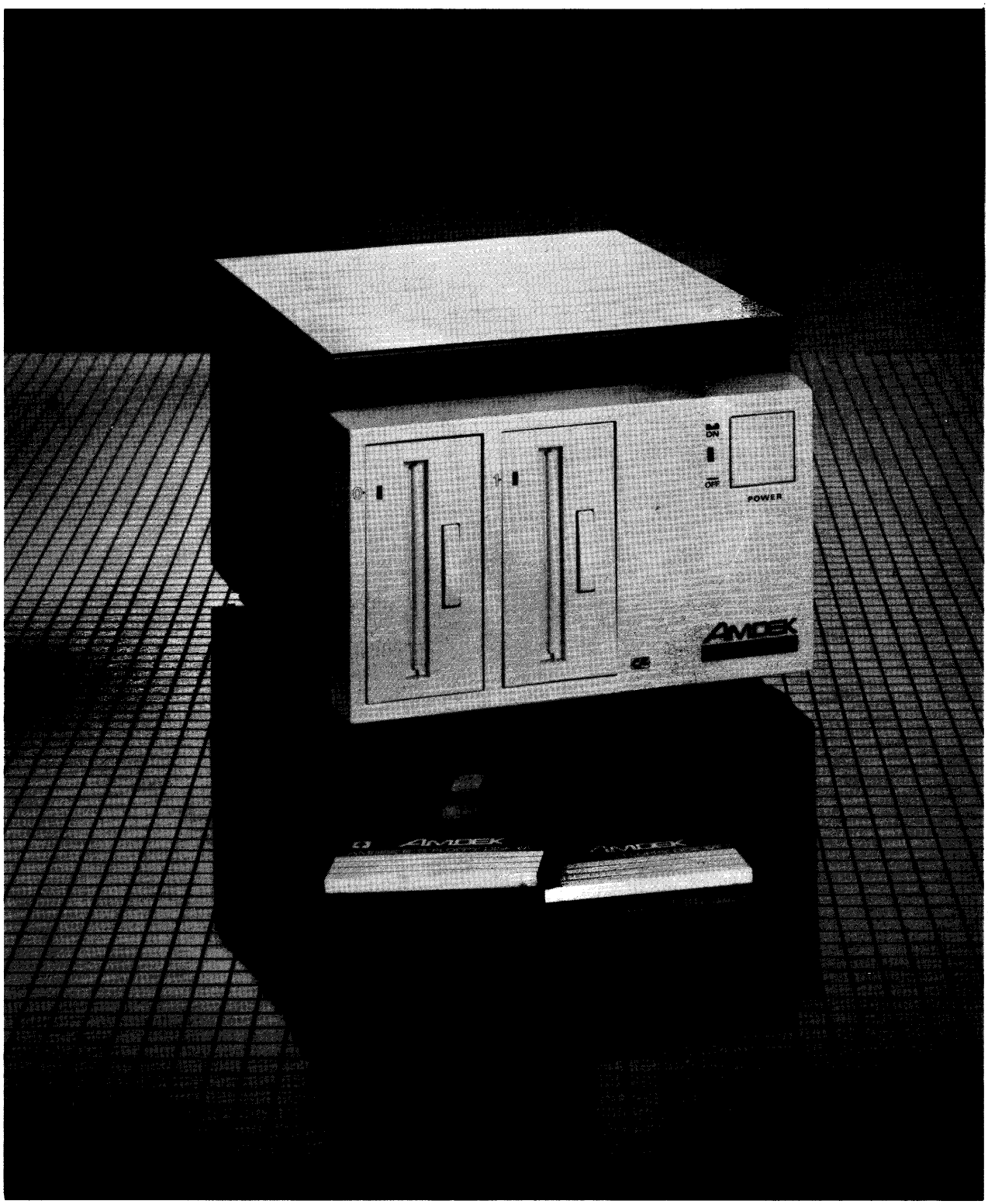
USER'S MANUAL
AMDC-I, AMDC-II



INTELLIGENT DISK DRIVE SYSTEMS FOR ATARI COMPUTERS

AMDEK

TABLE OF CONTENTS

SECTION		PAGE
	RADIO & TELEVISION INTERFERENCE INFO	1
1.0	INTRODUCTION	2
2.0	THE AMDC - FRONT & REAR VIEWS	2
3.0	FEATURES	3
4.0	CONFIGURATIONS	3
5.0	TECHNICAL SPECIFICATIONS	3
5.1	Power Requirements	3
5.2	Environmental Specifications	4
5.3	Formatted Disk Capacities	4
5.4	External Drive Requirements	4
5.5	External Disk Drive Interface	5
5.6	Media/Recording (3" Drives)	5
5.7	Access Time (3" Drives)	5
5.8	Reliability (Error Rates - 3" Drives)	5
5.9	Power Source - Cautions	5
5.10	Other Cautions	6
6.0	CARE & STORAGE OF 3" DISKETTES	6
6.1	Using the 3" Diskette	7
6.2	Facts to Remember About the 3" Diskette	7
6.3	Handling Precautions	7
6.4	Storage Instructions	7
7.0	SYSTEM CONSIDERATIONS	8
8.0	OPERATING MODES	8
9.0	INSTALLATION GUIDE	9
9.1	AMDC INSTALLATION - 3" Drive(s) Only	9
9.2	AMDC INSTALLATION - Using the AMDC with Atari Drives	10
9.2.1	Using Atari DOS 2.0S	10
9.2.2	Using DOS/XL Version 2	11
9.3	AMDC INSTALLATION - Using the AMDC with External Disk Drives	12
9.3.1	Using Atari DOX 2.0S	12
9.3.2	Using DOS XL Version 2	14

10.0 APPENDIX A - DISK DRIVE COMMANDS ____ 15

10.1 STANDARD COMMANDS ____ 15

10.1.1 Read Sector ____ 15
10.1.2 Write Sector ____ 15
10.1.3 Put Sector ____ 16
10.1.4 Format Disk ____ 16
10.1.5 Configure & Format Disk ____ 16
10.1.6 Status ____ 16

10.2 EXTENDED COMMANDS ____ 16

10.2.1 Read Configuration ____ 17
10.2.2 Write Configuration ____ 17
10.2.3 Send Special Format Table ____ 17
10.2.4 Read Drive Addresses ____ 18
10.2.5 Set Drive Addresses ____ 18
10.2.6 Reset Controller ____ 18
10.2.7 Identify Controller ____ 18
10.2.8 Configure to Diskette ____ 18
10.2.9 Read Switches ____ 19
10.2.10 Configure to 1050 ____ 19
10.2.11 Configure to 810 ____ 19
10.2.12 Configure to Double-Density ____ 19
10.2.13 Read Version Number ____ 19
10.2.14 Read RPM ____ 19

11.0 APPENDIX B - PRINTER PORT COMMANDS ____ 19

11.1 Write Printer Data ____ 20
11.2 Status ____ 20
11.3 Time Extend ____ 20

12.0 APPENDIX C - SAMPLE PROGRAMS ____ 20

12.1 IDENT ____ 20
12.2 IDTABLE ____ 20
12.3 CONTD ____ 21
12.4 CONFIG, CONFIG2, CONFIG3 ____ 21
12.5 FREFORM, FRE1050 ____ 22
12.6 TIMEXT ____ 22
12.7 VERSION ____ 23
12.8 RPM ____ 23

12.0 APPENDIX D - SWITCH SETTINGS ____ 23

13.0 APPENDIX E - ALTERNATE DISK DRIVE CONFIGURATIONS ____ 24

13.1 SPECIFIC CONFIGURATIONS ____ 25

14.0 APPENDIX F - AMDC CABLES ____ 27

15.0 APPENDIX G - USING EXTERNAL DISK DRIVES ____ 27

15.1 Configuring an External Drive _____ 27

16.0 APPENDIX H - TROUBLESHOOTING GUIDE _____ 29

LIST OF FIGURES

FIGURE 1.0 - FRONT VIEW - AMDC _____ 2

FIGURE 1.1 - REAR VIEW - AMDC _____ 2

FIGURE 2.0 - AMDC 3" MICROFLOPPY DISKETTE _____ 6

FIGURE 3.0 - ITEMS INCLUDED WITH AMDC _____ 9

FIGURE 4.0 - EXAMPLE - TERMINATOR RESISTOR LOCATION _____ 29

RADIO and TELEVISION INTERFERENCE

The equipment described in this manual generates and uses radio frequency energy. If it is not installed properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception.

The equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J, Part 15 of FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if you use a **"rabbit ear"** television antenna.

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripheral devices. If your computer does cause interference to radio or television reception, you may try to correct the interference by using one or more of the following measures:

- Turn the TV or radio antenna until the interference stops.
- Move the computer to one side or the other of the TV or radio.
- Move the computer farther away from the TV or radio.
- Plug the computer into an outlet that is on a different circuit than the TV or radio. (That is, make certain the computer and the radio or television set are on circuits controlled by different circuit breakers or fuses)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You also may find helpful the following booklet which was prepared by the Federal Communications Commission:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, stock number 004-000-00345-4.

WARNING

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only computers certified to comply with the Class B limits should be used in conjunction with this peripheral. Operation with non-certified computers is likely to result in interference to radio and TV reception.

1.0 INTRODUCTION

The AMDC (Amdek Disk Controller) from Amdek is a high performance 3" disk drive system for Atari computers. Designed to provide years of trouble-free performance, the system features the use of 3" compact floppy diskettes. The 3" diskette is constructed of hard plastic, and includes an automatic shutter mechanism which protects the recording media until it is inserted into the drive.

This operators manual will include: 1) A description of the features and technical capabilities which the AMDC System offers, 2) Detailed step-by-step instructions for installation and set-up of the system, 3) In-depth technical appendices which fully elaborate on the advanced capabilities of the AMDC, and 4) A trouble-shooting guide.

2.0 THE AMDC - FRONT AND REAR VIEWS

FIGURE 1.0

FRONT VIEW - AMDC

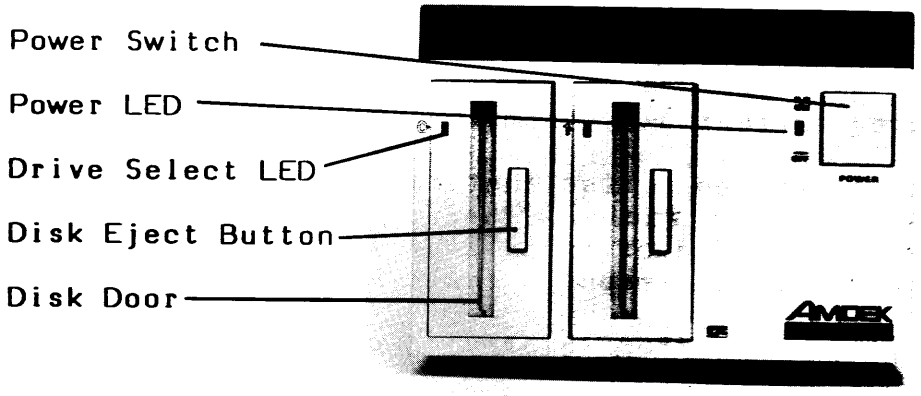
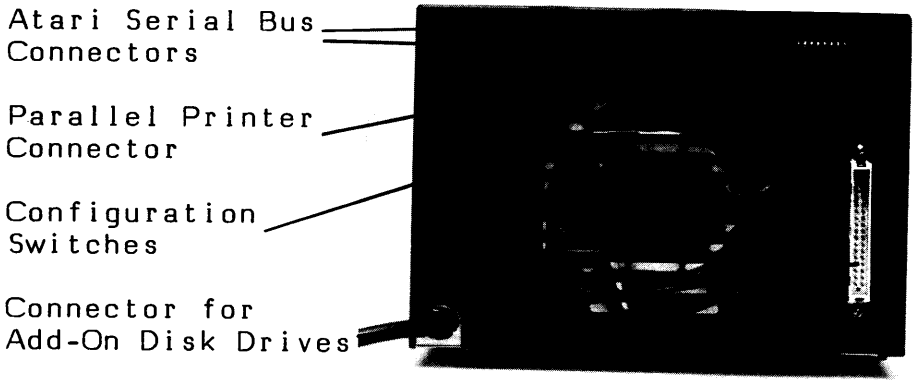


FIGURE 1.1

REAR VIEW - AMDC



3.0 FEATURES

1) The AMDC is fully compatible with Atari 400, 800, and XL Series* computers.

2) The 3" protected media used by the AMDC disk drives offers increased durability vs flexible jacket 5.25" media. In addition, it provides convenience since the diskettes occupy little space.

3) The AMDC is capable of controlling up to four disk drives, each programmable for single, or double-density. In double-density, the AMDC (with two 3" drives included) will provide up to 360K bytes of on-line, formatted storage capacity (180K bytes/side x 2 drives). By manually flipping the 3" diskettes over, an additional 360K bytes can be addressed.

4) The AMDC is fully compatible with DOS XL from Optimized System Software. (Amdek provides a complimentary copy of DOS XL Version 2 with each AMDC.)

5) The AMDC can be used in conjunction with an Atari 810/1050 (and compatible drives).

6) A standard 5.25" disk drive can be used with the AMDC to gain access to all Atari software on 5.25" minifloppies. In other words, a user is not required to have an Atari 810/1050 to "boot" Atari software.

7) The AMDC includes an Atari Compatible parallel printer/ plotter port.

*** Atari is a registered trademark of Atari Inc.**

4.0 CONFIGURATIONS

The AMDC is offered in two configurations:

1) The AMDC-I is a single 3" disk drive packaged with intelligent controller, power supply, and cabinet enclosure. This configuration can be optionally upgraded to a two drive package if desired by the user.

2) The AMDC-II is a dual 3" disk drive system packaged with intelligent controller, power supply, and cabinet enclosure.

5.0 TECHNICAL SPECIFICATIONS

5.1 Power Requirements

Power required for the 3" drive system and AMDC controller is :

105 - 125 Vac @ .9 Amp, 60 Hz

5.2 Environmental Specifications

Operating temperature	10 - 40 Deg.C
Operating humidity	20 to 80% non-condensing
Maximum Wet Bulb	29 Deg. C
Operating vibration	1 G max. (5-100 Hz, X,Y, and Z)

5.3 Formatted Disk Capacities

Density	40 Track 1 Side	2 Side	80 Track 2 Side
(DOS 2 Mode)			
Single	90 K	180 K	360 K
Double	180 K	360 K	720 K
(DOS 3 Mode)			
Single	90 K	180 K	360 K
Double	127 K	254 K	508 K

NOTE 1: The AMDC disk cartridges may be flipped over to provide twice the storage as 40 track single-sided media.

NOTE 2: Double-sided and 80 track drives may only be used with DOS XL (Version 4).

5.4 External Drive Requirements

The capabilities of the AMDC are optimized when used with Amdisk 3" disk drives. However, a number of manufacturers produce compatible 5.25" disk drives that may be attached externally. External drives can be used with the AMDC if they meet the following **MINIMUM** requirements:

* Disk rotational speed of 300 rpm
* 40 track performance
* 6 ms. stepping time
* 15 ms. settling time
* Motor start-up time of 0.7 seconds

NOTE: The AMDC requirements for number of tracks and stepping time are the power-on defaults. Those values may be changed using the AMDC extended commands under software control. (See Appendix A, Section 10.2, for a discussion of extended commands)

5.5 External Disk Drive Interface

The AMDC is capable of controlling disk drives with the following interface:

Connector = 34 pin, 5.25" Shugart type

Pin No.	Signal	Pin No.	Signal
2	Unused	20	Step
4	In use (option)	22	Write Data
6	Drive Select 3	24	Write Gate
8	Index	26	Track 00
10	Drive Select 0	28	Write Protect
12	Drive Select 1	30	Read Data
14	Drive Select 2	32	Unused or Side Select
16	Motor-on	34	Ready
18	Direction	1-33	Ground

5.6 Media/Recording (3" Drives)

	Single Density	Double-Density
Record Surfaces	2	2
Cylinders	40	40
Tracks	80	80
Encoding	FM	MFM
Max. Record Density	4473 Bpi	8946 Bpi
Track Density	100 Tpi	100 Tpi
Transfer Rate	125K bits/sec.	250K bits/sec.

5.7 Access Time (3" Drives)

Average Access Time = 100 msec (approx.)
Track to Track = 6 msec
Settling Time = 15 msec
Avg. Latency Time = 100 msec
Head Load Time = --
Motor Start Time = 0.7 seconds MINIMUM
Disk Speed = 300 rpm

5.8 Reliability (Error Rates - 3" Drives)

Soft Error = 1 x 10 (-9)
Hard Error = 1 x 10 (-12)
Seek Error = 1 x 10 (-6)

5.9 Power Source - Cautions

1) The AMDC is designed to operate on 115v/60Hz AC current only! NEVER CONNECT THIS PRODUCT TO OTHER THAN THE SPECIFIED VOLTAGE, TO 50 Hz, OR TO DIRECT CURRENT. (For information on how to modify this product for 50 Hz operation, please contact Amdek.)

2) This product is equipped with a polarized alternating line plug. As a safety feature, this plug will fit into the power outlet only one way. DO NOT DEFEAT the safety purpose of the polarized plug.

3) When the power voltage is extremely high or low, it may cause problems or may limit optimum performance. Consult your dealer if this situation should arise.

5.10 Other Cautions

1) Keep this product away from water or other liquids. If any liquid enters the unit, immediately remove the plug and consult your dealer.

2) Keep this product in a well-ventilated place. Ventilation holes are provided in the cabinet to prevent the temperature from rising. Please do not cover the unit with a cloth, or place it on a carpet as this can clog the ventilation holes.

3) Since excessive heat can cause damage to the unit, avoid placing it in direct sunlight or near a heating appliance.

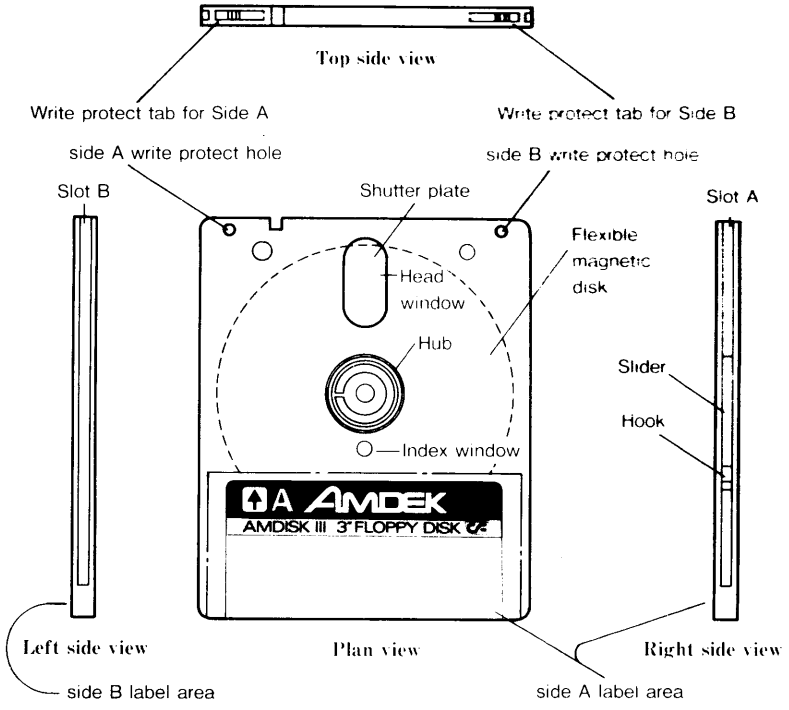
4) Do not place the unit in a place with much moisture or dust as this could cause damage to the unit.

5) Be certain to remove the power plug from the socket when the unit will not be used for a long time.

6.0 CARE & STORAGE OF 3" DISKETTES

FIGURE 2.0

AMDC 3" MICROFLOPPY DISKETTE



6.1 Using the 3" Diskette

To insert the diskette into the drive, hold the label area of the diskette, and push it into the drive until you hear it "click" into position. When you are finished using that particular diskette, press the eject button located just to the right of the drive door and the diskette will pop out.

6.2 Facts to Remember about the 3" Diskette

- This microfloppy diskette is **useable on both sides.**
- When using the diskette on Side A, to access Side B simply flip the diskette over as you would a cassette tape.
- To prevent further writing of data to a diskette, open the **Write Protect** holes by sliding the write protect tabs toward the inside with the tip of a ballpoint pen or equivalent implement. (See Figure 2.0 for the location of Write Protect tabs.)

6.3 Handling Precautions

- Do not attempt to open the shutter and touch the diskette surface.
- Do not forcibly press the shutter plate or apply excessive force to the opening/closing slider.
- Do not forcibly bend the diskette.
- Always keep the hub clean; a deformed or contaminated hub may cause errors.
- Do not use thinner, alcohol, or freon to clean the diskette.
- Do not touch the diskette with an eraser.
- Avoid eating or smoking around the diskette.

6.4 Storage Instructions

- Do not store the diskette in locations exposed to excessive heat, humidity, or direct sunlight.
- Avoid storing in locations where strong magnetism is generated.
- Avoid storing in a location which is liable to cause dust or dirt accumulation.

7.0 SYSTEM CONSIDERATIONS

To use the AMDC with Atari computers, the following requirements must be met:

1) The particular Atari computer must have a minimum of 24K bytes of RAM.

2) The user must have a copy of Atari DOS 2.0, 3.0 or DOS XL, **For the user's convenience, Amdek includes a complimentary copy of DOS XL (Version 2) with every AMDC.**

8.0 OPERATING MODES

The AMDC controller has two major modes of operation. The first is the DOS XL, DOS 2.0 extension of single/double density; the second is the DOS 3.0 Atari 1050 single/double density.

The accepted standard for single/double density disk drives for the Atari is the DOS XL, DOS 2.0 method. This mode uses 128 bytes per sector for single-density, and 256 bytes per sector for double-density. In single and double-density, a standard 40 track disk contains 720 sectors. Each drive has the ability to automatically sense the density (ASD) of the diskette anytime sector 1 on that drive is read. DOS XL and DOS 2.0 only take advantage of the ASD capability when booting from drive D1. The AMDC is shipped from the factory to run in the DOS XL mode.

The Atari 1050 disk drive introduced an alternate form of double-density. Instead of changing the sector size, Atari increased the number of sectors available on a diskette. Double-density for the 1050 drive has 1024 sectors of 128 bytes each. The advantage of this method is that since the sector sizes for single and double-density are the same, ASD may occur any time a read takes place. Hence, you never need to be concerned about the density. The disadvantage is that double-density stores less than the DOS XL mode (about 30 % less). The Atari 1050 also uses some alternate commands for double-density operation that are not supported by DOS XL or DOS 2.0S. Atari's new DOS 3.0 will use the 1050 in single and double-density operation.

Amdek has provided BOTH methods of single/double density operation with the AMDC. Switch position 8 on the upper right rear of the AMDC determines the operating mode (refer to section 12 Appendix D for switch settings). Please note, that when in either mode, the double-density of the other mode will not be recognized. Also in the 1050 (DOS 3.0) mode, any read error causes ASD which will reconfigure the drive specification table. If you are using custom configurations this will reset them (this will happen in the DOS XL mode also, anytime you read sector 1).

9.0 INSTALLATION GUIDE

FIGURE 3.0

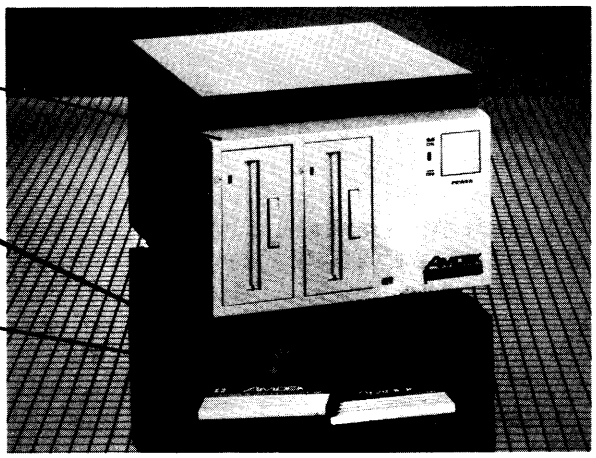
ITEMS INCLUDED WITH THE AMDC

AMDC Disk Drive Unit

Blank 3" Diskette

3" Diskette which contains DOS XL, DOS 2.0 Patch and Utility Programs

System Interconnect Cable (not pictured)



For safety purposes, before beginning any of these installation procedures, switch off the power to the computer and all attached peripherals.

9.1 AMDC INSTALLATION - 3" Drive(s) Only

NOTE: When shipped, the AMDC is configured to operate in double-density mode,(twice the storage capacity of Atari 810 drive), and its starting address is D1 (D1 = The first disk drive to be recognized by the computer). For a discussion of how to change this default density and starting address, refer to Appendix D, (Switch Settings) for hardware configuring the AMDC.

A) Attach the AMDC to the Atari computer using the disk drive interface cable. Please refer to your Atari Computer manual for the location of the proper connector(s) for using disk drives. For the AMDC, the cable can be plugged into either of the two disk drive connectors located at the upper left rear of the unit. (See Figure 1.1 on page 1).

B) Turn on the AMDC and any other peripherals. Insert the copy of DOS XL on the 3" media which was included in the packaging along with the AMDC unit. The diskette should be placed in the Amdisk drive labeled "0" for either the AMDC-I or AMDC-II configuration.

C) Power-up the particular Atari computer to "boot" the DOS/XL system disk. The DOS XL menu will now appear on the screen. At this point, refer to your DOS XL manual which was included with the AMDC. This documentation provides a complete discussion of all commands and features of this high performance operating system. In particular, you should initially concentrate on Chapters 1, 2, & 3 in each manual since they will provide you with a solid overview of how to use this DOS. With DOS XL, you

will now be able to format up to 180K bytes of on-line, double-density storage per side of each 3" diskette.

D) When you have completed your task(s), remove the diskette(s) from the drive(s), THEN turn off the power to the AMDC, the computer, and any other peripherals.

9.2 AMDC INSTALLATION - Using the AMDC with Atari Drives

For safety purposes, before beginning any of these installation procedures, switch off the power to the computer and all attached peripherals.

The following instructions are applicable if you are interfacing an Atari 810 or 1050 (or other compatible drive) to your computer as well as the AMDC. These instructions assume that you wish the 810 or 1050 drive to be configured as D1, and the AMDC to be D2 (& D3 if you have AMDC-II).

9.2.1 Using Atari DOS 2.0S

Although Amdek provides a fully compatible, full featured DOS (DOS XL) with the AMDC, we have also provided a double-density patch to Atari DOS 2.0S for those users already familiar with that operating system. We recommend that in addition to using the patched Atari DOS, you also become familiar with DOS XL. We feel that you will find DOS XL more powerful and useful as your computer skills grow.

A) Attach your Atari Drive to your computer as shown in your Atari disk drive manual.

B) Attach your AMDC to the Atari disk drive with the bus cable provided.

C) Configure your Atari drive to be D1 (Atari Drives are factory-shipped with this setting). Facing the rear panel drive select switches of the drive, be sure the switches are both to the left. (This is the D1 setting)

D) Configure the AMDC to start with D2. Facing the switches on the upper right rear of the AMDC, switch 5 should be turned ON (DOWN) and all others OFF (UP). This also configures the 3" drive(s) for double-density. For a complete discussion of the switch settings, please see Appendix D.

E) Turn the power ON to your Atari disk drive, the AMDC, and other system peripherals. (T.V./monitor, printer, etc.) Insert a copy of Atari DOS 2.0S into your Atari drive, and turn ON your computer. If there is a BASIC cartridge installed, a READY message will appear and you must type in the letters DOS. NOTE: Some XL Series computers have BASIC as a standard feature and will give the READY message. After this message appears, type in the letters DOS.

F) Insert the DOS XL 3" diskette into the 3" drive marked 0 with the label towards the left. When DOS 2.0S has presented its option menu, select option L for LOAD BINARY FILE. Type D2:AMDEKP.BLD and press RETURN. This will load the patch file and modify DOS 2.0S.

G) Remove your DOS 2.0S diskette from your Atari drive and insert a blank 5.25" diskette. Hitting the START key will format the 5.25" diskette in drive D1 and write the patched Atari DOS files. Use this enhanced DOS as if you were using standard DOS 2.0S. Refer to the Atari DOS Reference Manual for complete DOS operation. Please note, this new double-density DOS will NOT function in double-density on the Atari disk drives, they can only be used in single-density operation.

H) When you have completed your task(s), remove all diskettes from the drives, THEN turn the power off to the AMDC, the computer, and any other peripherals.

9.2.2 Using DOS XL Version 2

Before implementing this procedure, switch off the power to the computer and all attached peripherals.

A) Attach your Atari drive to your computer as shown in your Atari disk drive manual.

B) Attach your AMDC to the Atari disk drive with the bus cable provided.

C) Configure your Atari drive to be drive D2 (or D3 if using and AMDC-II). For D2 (Using an AMDC-I) set the Atari drive select switches so the white switch is to the left and the black switch is to the right. The D3 (Using an AMDC-II) switch setting is both to the right (when facing the rear panel). Your Atari disk drive manual provides diagrams to aid you in reconfiguration.

D) Configure your AMDC to start with drive D1. To do this, the rear panel switches of the AMDC should be all OFF (UP). This configures for drive D1 AND double density. For a complete discussion of the switch settings, refer to Appendix D.

E) Turn the power ON to your Atari disk, the AMDC and other system peripherals (T.V., monitor, printer, etc.). Insert the provided copy of DOS XL into the 3" drive labeled 0 with the diskette label towards the left. Turn the computer ON to boot the disk and the DOS XL menu will then appear.

F) Insert a blank 5.25" diskette into the Atari disk drive. When DOS XL presents its menu, type I for INITIALIZE DISK. DOS XL will load the INIT program, display a number of functions, and ask for your choice. Type 2 and RETURN for FORMAT DISK AND WRITE DOS.SYS. Next, enter the drive number of the Atari disk drive (it should be 2 or 3 depending on step C above) and RETURN. DOS XL will ask if you are sure, type Y and RETURN. DOS XL will now format the

5.25" disk and write the new DOS file.

G) When formatting is complete, DOS XL will ask you to hit RETURN for the next function, do so. Select function 4 to EXIT TO DOS XL.

H) After the menu reappears, type X. Next, type COPY *.*,D2: (Or D3 if you have an AMDC-II) and hit RETURN. This will copy all files on your DOS XL master disk to the 5.25". (This will take 2 - 3 minutes.

You should repeat steps F,G & H to obtain a second 5.25" master diskette. This will prevent you from having to reconfigure your system if your master was to be damaged.

I) Remove all diskettes from the drives and turn the power to the computer and all peripherals OFF. Reconfigure your disk drives by setting the Atari drive to drive D1 (both switches to the left) and the AMDC to start at drive D2 (rear panel switch 5 ON, all others OFF). The next time you use your system the Atari drive will be drive D1 and can be used to boot DOS XL (single-density).

J) When you have completed your task(s), remove diskettes from all drives, THEN turn the power off to the AMDC, the computer, and any other peripherals.

9.3 AMDC INSTALLATION - Using the AMDC with External Disk Drives

For safety purposes, before beginning any of these installation procedures, switch off the power to the computer and all attached peripherals.

The following instructions are applicable if you are interfacing an external 5.25" disk drive (with its own power supply) to the rear panel connector of the AMDC. It is assumed that you wish the external drive to be D1 and the 3" drive(s) to be D2 (& D3 if you have the AMDC-II). It is also assumed that you have read Appendix G, and have configured the external drive hardware accordingly. If you have not done so, do it at this time. Damage to the AMDC controller may result from improper configuration of external drives.

9.3.1 Using Atari DOS 2.0S

Atari DOS 2.0S is NOT provided with the AMDC. It may be purchased from Atari dealers.

A) Attach the AMDC to the Atari computer with the serial cable provided.

B) Attach the external drive to the connector located at the lower right rear of the AMDC noting that pin 1 of the connector is towards the bottom. (Red stripe is at the bottom of the cable.)

C) Configure the AMDC to start at D1 and to map the 5.25" at drive D1. Set the switches at the upper right rear of the AMDC to all OFF (UP). The AMDC is shipped from the factory with this setting.

D) Turn the power ON to the external drive, THEN to the AMDC and other peripherals (T.V., monitor, printer, etc.). If the drive select lights on all drives illuminate, immediately turn the AMDC and external drive OFF. This is an indication that the external drive cable is probably not connected to the AMDC with pin 1 towards the bottom. Please check and repeat this step. Insert your copy of Atari DOS 2.0S into the 5.25" disk drive. Turn the computer ON to boot the disk. If there is a BASIC cartridge installed, a READY message will appear and you must type the letters DOS. NOTE: some XL series computers have BASIC as a standard feature and will display the READY message. When this message appears, type the letters DOS.

E) Insert the DOS XL 3" diskette into the 3" drive marked 0 with the label towards the left. When DOS 2.0S has presented its option menu, select option L for LOAD BINARY FILE and hit RETURN. Then, type D2:AMDEKP.BLD and RETURN. This will load the patch file and modify DOS.

F) Remove your DOS 2.0S diskette from the external drive and insert a blank 5.25" diskette. Hitting the START key will format the 5.25" diskette in drive D1 and write the patched Atari DOS files. Use this enhanced DOS as if you were using standard DOS 2.0S. Refer to the Atari DOS Reference Manual for complete DOS operation.

The enhanced DOS copy you just made is recorded in single-density and will force D1 to single-density mode. To obtain a double-density version perform the following steps.

G) Remove the DOS XL diskette from the 3" drive (labeled 0) and insert a blank 3" diskette.

H) Select the DOS I command for FORMAT DISK and type RETURN. Select drive 2 and RETURN. Type Y and RETURN to format.

I) Select the DOS H command for WRITE DOS FILES and RETURN. Select drive 2 and RETURN. Type Y and RETURN to write DOS. This gives you a double-density version on 3" diskette.

J) Remove all diskettes from the drives and turn the AMDC power OFF. Set the rear panel switches on the upper right rear of the AMDC to 7 ON (DOWN) all others OFF. This configures the AMDC to be D1 and the 5.25" drive to be D2 (or D3 if you have an AMDC-II) Now, turn the AMDC power ON.

K) Insert the double-density copy you made in step J into the 3" drive labeled 0. Turn the computer OFF, wait 5 seconds, and turn the computer back ON. The computer will boot the enhanced DOS from the 3" drive. If a READY message displays, type the letters

DOS.

L) Insert a blank 5.25" disk into the external disk drive. Now, repeat steps H and I but substitute the drive number of the 5.25" drive (it should be D2 when used with and AMDC-I or D3 used with an AMDC-II). This will give you the enhanced DOS recorded in double-density.

M) Remove diskettes from all the drives. Reconfigure the 5.25" drive as drive D1 by setting all rear panel switches on the AMDC to OFF (UP), then turn the AMDC OFF then ON. Insert the 5.25" disk with your double-density DOS, turn the computer OFF for about 5 seconds, then turn it ON to reboot the DOS.

N) When you have completed your task(s), remove all diskettes from the drives, THEN turn off the power to the AMDC, the computer, and any other peripherals.

9.3.2 Using DOS XL Version 2

Before implementing any of these procedures switch off the power to the computer and all peripherals.

A) Attach the AMDC serial port to the computer with the cable provided.

B) Attach the external drive to the connector located at the lower right rear of the AMDC noting that pin 1 of the connector is towards the bottom. (Red stripe on the cable at the bottom of the connector)

C) Configure the AMDC to start at D1 and to map the 5.25" at drive D2 (or D3 if you have an AMDC-II). Set the rear panel switches on the AMDC to 7 ON (DOWN) all others OFF (UP).

D) Turn the power ON to the external drive. THEN to the AMDC and other system peripherals (T.V., monitor, printer, etc.). Insert the provided copy of DOS XL into the 3" drive labeled 0 with the diskette label towards the left. Turn the computer ON to boot the disk. The DOS XL menu will be displayed on the screen.

E) Insert a blank 5.25" diskette into the external disk drive. When DOS XL presents its menu, type D for DUPLICATE DISK. You will be asked if it is double-density, type Y and RETURN. Next, you will be asked the source and destination drives. Type 1 and RETURN for source and 2 (or 3 if you have an AMDC-II) and RETURN for destination. The computer will ask if it should format, type Y and RETURN. The screen will now display the message PUT SOURCE IN DRIVE 1, PUT DESTINATION IN DRIVE 2 (for an AMDC-I, Drive 3 for an AMDC-II). The screen will then read TYPE RETURN WHEN READY. If you have inadvertantly entered the wrong source and destination disk drives, or if you simply wish to begin the procedure over again, hit RESET. Otherwise, type RETURN and the formatting and copying will take place. This will take 2 - 3 minutes.

F) The computer will ask if you want more copies. It would be wise to make another 5.25" master diskette, to avoid having to reconfigure your system should your master become damaged. To make another copy type, Y and RETURN and install another blank diskette into the external drive, Type RETURN when ready.

G) When you are completed making copies, type in N and RETURN when the computer asks if you would like to copy again.

H) Remove the diskettes from all drives and turn the AMDC power OFF. Set the switches on the upper right rear of the AMDC all OFF (UP). Turn on the power to the AMDC and insert your newly made copy of DOS XL on 5.25" media into the external drive. Turn the computer OFF, wait 5 seconds and turn it ON again. The computer should now address the 5.25" external drive as D1 and boot DOS XL.

I) When you have finished your task(s), remove all diskettes from the drives, THEN turn off the power to the AMDC, the computer, and any other peripherals.

10.0 APPENDIX A - DISK DRIVE COMMANDS

In addition to the standard Atari 810/1050 command sets, the AMDC for the Atari computer can accept a number of commands to configure and format. These commands will be specified by: 1) Their ASCII bus command in quotes, 2) Their hexadecimal and decimal values [in the form (hex/dec)], and 3) A description of the command function. This appendix is intended for the experienced programmer that is familiar with CIO and SIO useage. For more information, please refer to the Atari System manual.

10.1 STANDARD COMMANDS

Standard commands are the commands your computer uses in normal operation. They are the only commands used by the Atari 810 and 1050 disk drives. These commands include Read, Write, Format and Status.

10.1.1 Read Sector

"R" (52/82) - The read sector command instructs the AMDC to read the specified sector from the specified drive and pass 128 or 256 bytes (depending on the drive configuration) to the computer. A bad sector number, missing sector, or improperly written sector will cause an error.

10.1.2 Write Sector

"W" (57/87) - The AMDC will accept 128 or 256 bytes (depending on the configuration of the specified drive) and write the data to the specified sector. A write protected disk or read after write verify failure will cause an error.

10.1.3 Put Sector

"P" (50/80) - Put sector performs the same as Write sector but will not do a read after write verify.

10.1.4 Format Disk

"!" (2E/46) - The AMDC will format the specified drive to the current configuration. Disks may be single or double-density, single or double-sided, 40 or 80 tracks per side. Each track is read after it is written to verify the formatting process. Bad sectors are passed back to the computer at the end of formatting. These values are the actual sector numbers stored in the 6502 format of low byte/high byte. Up to 64 bad sectors may be reported when formatting 128 byte sector disks, 128 for 256 byte sectors. Write protected disk or unusable disks will produce an error. **NOTE:** In the DOS 3.0 (Atari 1050) compatible mode, this command will format to standard single-density.

10.1.5 Configure and Format Disk

""" (22/34) - (quote mark, only supported by DOS 3). The disk drive will be configured to the Atari 1050 double density mode, and the diskette will be formatted. Any formatting error (such as no diskette in the drive) will leave the drive configured in the 1050 double-density mode.

10.1.6 Status

"S" (53/83) - The Status command causes the AMDC to send 4 bytes of the last commands' status concerning the specified drive to the computer. These bytes are defined as follows:

1. Drive Status - bit 0 - command invalid
   bit 1 - data frame invalid
   bit 2 - read/write error
   bit 3 - write protected diskette
   bit 4 - motor is on
   bit 5 - sectors are 256 bytes long
   bit 6,7 - not used

2. Control Status - defined in the WD1771 data sheet.

3. Time Out - the disk drive time out value (78 seconds)

4. Current Track - the current track position of the disk drive (not Atari standard)

10.2 EXTENDED COMMANDS

The Extended commands are concerned with configuring the multiple drive controller, using different disk formatting and fast access read and write. **NOTE:** extreme care should be taken when using any extended command. If a problem occurs, issue a RESET command or remove the diskettes and turn the disk controller power OFF then

ON (this will reset the controller).

10.2.1 Read Configuration

"N" (4E/78) - The AMDC will send 12 bytes to the computer describing the set up of the specified drive. The bytes are:

1. Number of tracks per side (literal value - the only practical values are 40 or 80)

2. Track to track step rate code (default is: 0 - 6 ms.)

0 - 6 ms.
1 - 12 ms.
2 - 20 ms.
3 - 30 ms.

3 & 4. Sectors per track (literal value - the only practical values are 18 or 26 for Atari compatible diskettes)

5. Number of sides

0 - single-sided
1 - double-sided

6. Drive density

0 - single-density
4 - double-density

7 & 8. Bytes per sector (literal value - the only practical values are 128 or 256 for Atari compatible diskettes)

9. Drive present status (if <>0 drive is useable)

10. Serial control - the current ACIA set up

11 & 12. Reserved (0)

10.2.2 Write Configuration

"O" (4F/79) - The AMDC will accept the 12 byte configuration string and configure the drive.

10.2.3 Send Special Format Table

"f" (66/102) - The computer will send a 26 byte string defining the sector order for the next format command. The next command must be a format command or the formatting order will revert to the default format. Up to 26 sectors may be formatted, the format routine will only use table values up to the configured drives' capacity (eg. single-density and 256 byte double-density will only use the first 18 bytes sent as the format order table).

10.2.4 Read Drive Addresses

"c" (63/99) - The AMDC will send the 4 byte drive address table. The 4 entries are the bus addresses of the drives attached. If a drive is not present, the corresponding table entry will be zero. Power-on default addresses are:

1. drive 1 address default = $31 + AMDC address switch
2. drive 2 address default = $32 + AMDC address switch
3. drive 3 address default = $33 + AMDC address switch
4. drive 4 address default = $34 + AMDC address switch

10.2.5 Set Drive Address

"d" (64/100) - The computer must send a 4 byte string with the new device addresses. The four bytes correspond to the four available drives. Disk drive addresses are hex values 31 to 38.

NOTE: Addressing two drives as the same device will cause the last disk assigned to respond.

10.2.6 Reset Controller

"x" (78/120) - The AMDC will do a power-on reset (as though the power was turned off and on).

10.2.7 Identify Controller

"i" (69/105) - The AMDC will respond with the number of disk drives attached to the controller when the first disk address on the controller chain is accessed by this command.

10.2.8 Configure to Diskette

"C" (43/67) - The AMDC will check the diskette in the specified disk drive and configure the device table for the proper density. Only the density and bytes per sector will be changed (no provision is made for double-sided or 80 track drives). One byte will be passed back to the computer. Its value will be defined as:

0 - No diskette in the specified drive (density not adjusted).

1 - Diskette (and current configuration) is single-density.

2 Diskette (and current configuration) is double-density

NOTE: "2" (double-density) depends on the operating mode. In the DOS 3.0 mode this means 26 128 bytes sectors per track. In the DOS 2/DOS XL mode the disk has 18 256 byte sectors per track.

10.2.9 Read Switches

"s" (73/115) - One byte is sent to the computer containing the value of rear panel setup switches. This is used in testing the AMDC.

10.2.10 Configure to 1050

"t" (74/116) - The AMDC will configure the specified drive to Atari 1050 compatible double density - 128 bytes per sector, 26 sectors per track, 40 tracks, 1 side, 1024 sectors per disk.

10.2.11 Configure to 810

"u" (75/117) - The AMDC will configure the specified drive to Atari 810 compatible single-density - 128 bytes per sector, 18 sectors per track, 40 tracks, 1 side, 720 sectors per disk.

10.2.12 Configure to Double-Density

"v" (76/118) - The AMDC will configure the specified drive to the standard double-density - 256 bytes per sector, 18 sectors per track, 40 tracks, 1 side, 720 sectors per disk.

10.2.13 Read Version Number

"V" (56/86) - The AMDC will send a 25 byte string containing the ROM software version number.

10.2.14 Read RPM

"q" (71/113) - The AMDC sends a two byte number representing the specified disk drives' RPM (Revolutions/Minute). The number is sent with the most significant byte first (MSB, then LSB). To calculate the RPM:

RPM = MSB * 256 + LSB

NOTE: Some disk drives have longer start up times than others. It may be wise to issue this command 3 or 4 times and take the last reading as the true R.P.M. Also, a diskette must be installed in the drive or an error will result.

11.0 APPENDIX B - PRINTER PORT COMMANDS

The AMDC printer port is software compatible with the Atari 850 parallel port. It uses the same standard commands as the Atari port, in addition to a special command for setting the port timeout value. These are described on the following page.

11.1 Write Printer Data

"W" (57/87) - The computer sends 40 bytes of data to the AMDC for printing (to address "P1").

11.2 Status

"S" (53/83) - The AMDC will send the 4 byte printer status string to the computer. The 4 bytes are defined as:

1. Port Status = 128 if previous command was successful.
   = 129 if previous command was bad.
   = 130 if previous data frame was in error.
   = 132 if previous command timed out.

2. Hardware Status = 255 always.

3. Port Timeout = 20 (seconds) - Atari 850 is 5 seconds.

4. Not used. = 0 (always)

11.3 Time Extend

"e" (65/101) - The computer should send 1 byte representing the number of seconds the printer timeout period should be.

12.0 APPENDIX C - SAMPLE PROGRAMS

A number of sample programs are included on the Amdek/DOS XL diskette. These programs, written in Atari BASIC, demonstrate how to use the extended AMDC commands. A full explanation of each command is given in Appendix A, Disk Drive Commands. These programs may NOT be used with DOS XL Version 4 or Atari DOS 3.0 since they make use of internal calls to DOS XL (DOS 2.0) . Each program is explained below. **NOTE:** Please use extreme caution when running the programs FREFORM and FRE1050 as they will FORMAT the specified diskette! None of the other sample programs will cause any damage, however, if they are used improperly, you may be required to send the RESET command or turn the AMDC power OFF then ON in order to reset.

12.1 IDENT

This program uses the "i" (Identify) command to locate your Amdisk drives. The computer will go out and check the serial bus for the AMDC controller and ask it how many drives are attached. Most of the other programs described here use the "i" command to find the starting address of the controller.

12.2 IDTABLE

This program uses the "c" and "d" commands (Read Drive Addresses, Set Drive Addresses) to allow you to choose the logical drive address of each drive attached to the AMDC. The program will display the physical and current logical addresses and allow you

to change the assignments. The physical number is the number the AMDC sees when it talks to the drives. These numbers will always be 1 and 2 for the 3" disks and 3 and 4 for any externally attached disks. The logical number represents the drive number your Atari computer calls that specific drive. For instance, if your AMDC-II is set to start at D1, then the logical and physical numbers of the 3" drives will be 1 and 1, and 2 and 2. You can make the Atari think that the AMDC-II drive 2 is really drive 1 or the AMDC-II drive 4 is drive 2 etc. This capability is primarily useful for AMDC units with 5.25" disk drives attached as external drives. With these two commands, you can select which disks to boot from under program control! Please note, if you change the IDTABLE the drive should be of the same configuration or DOS will not understand the drives. In this case, turn your Atari OFF then ON, and reboot from the new Drive 1. Or, run CONTD to configure DOS to your new IDTABLE or modify the program to reconfigure DOS for you!! (look at how the other programs reconfigure DOS).

12.3 CONTD

The name of the program stands for "Configure to Diskette" which is command "C". This program uses "i" (Identify) to find the AMDC and the number of drives attached. Next, each drive is told to check the diskette and configure to the diskette density. Finally, DOS is reinitialized to set the buffers to the proper sizes. Please note that this command will also tell you if the disk drive does not have a diskette in it! (5.25" drives will report NO DISKETTE if a single-sided diskette is used on the back side).

12.4 CONFIG, CONFIG2, CONFIG3

These three programs have very similar functions - they allow you to configure the disk drives any way you want them ! Each allows different degrees of flexibility in configuration and we will start with the simplest - CONFIG3. CONFIG3 uses three different commands to set a drive to one of three standard configurations. These are:

"t" - Atari 1050 Double-density
"u" - Atari 810/1050 Single-density
"v" - 256 byte Double-density

These commands do not require any parameters except drive number, which makes them somewhat easier to use than the complete configuration commands ("N" and "O"). The program will allow you to choose the configuration by number (1, 2 or 3). (Appendix A "Disk Drive Commands" gives the complete default configurations).

The other two configuration programs, CONFIG and CONFIG2, use the "N" and "O" commands to allow very flexible configurations. A user could configure the disk drives to be able to read a number of OTHER computers' diskettes (very handy for transferring data from one computer to another). CONFIG only allows the alteration of tracks per side, step rate code, number of sides, and the

density. CONFIG2 does everything CONFIG does but also lets you change the number of sectors per track , and bytes per sector. With these commands you can configure the AMDC to control an 80 track, double-sided, double-density 5.25" drive for 737k bytes of storage!! (Can NOT be used with Atari DOS - it MAY be used with DOS XL Version 4). **NOTE:** There ARE practical limitations to each configuration attribute. Sector sizes must be 128 or 256 only! You can fit a maximum of 18, 128 byte single-density sectors, 18 256 byte double density sectors, or 26, 128 byte double density sectors on each track. Other sector sizes, and track sizes may not format properly. Again refer to Appendix A "Disk Drive Commands" for more details on reliable values for configuration.

12.5 FREFORM, FRE1050

FREFORM & FRE1050 allow YOU to specify the sector order on the disk. FREFORM is used for standard 18 sector disks, FRE1050 is used for Atari 1050 compatible double-density disks. FRE1050 must be used in the DOS XL operating mode and will not increase your disk storage capacity. This is because DOS XL and DOS 2.0 are incapable of using the extra disk space. This utility is included for demonstration of the AMDC extended command set.

BEWARE, you will destroy all data on the diskette when you issue the format command!! (The program may be stopped by hitting the BREAK key without data loss as long as it is stopped before the 18th sector name is entered). Note, for normal useage, the Amdek AMDC standard format will use the optimal sector order. **NOTE:** The AMDC special format command will only format ENTIRE disks. It may not be used to copy copy-protected disks that utilize alternate formats to protect from software pirating! (It can, however, be used to CREATE software protection schemes!). When using FREFORM with configurations specifying less than 18 sectors, the significant entries are the LAST in the list. For example, if you are formatting 16 sectors, the first two sector inputs in FREFORM are meaningless, the LAST 16 will be your new sector order.

12.6 TIMEXT

TIMEXT stands for "Time Extend". This program is used to set the printer port timeout value. The standard Atari timeout is only 5 seconds, which means the device that you are communicating with must be able to take commands at least every 5 seconds. This is not long enough if you are using a plotter instead of a printer. The AMDC printer port timeout default value is 20 seconds, good enough for most plotters . In case your device needs a longer timeout (or if you want it shorter), "TIMEXT" will enable you to set it from 1 to 255 seconds.

12.7 VERSION

When run, this program will tell you the version number and date of the AMDC operating software. This number will make it easier for the Amdek support group to help you if a problem should occur with your AMDC.

12.8 RPM

This utility uses the "q" (RPM) command. When this command is issued, the AMDC checks the specified drive and returns the RPM number. This RPM program may only be used form drives attached to the AMDC controller. To stop the program, hit the BREAK key. To see the RPM value of another program, type RUN again, and enter the new drive number.

13.0 APPENDIX D - SWITCH SETTINGS

On the upper right rear of the AMDC control unit is a set of switches labeled 1-8. These switches are used to configure the AMDC to your system needs. On power-up, the AMDC checks for the number of attached disk drives and uses the switch settings to establish the densities, drive addresses and disk compatibility mode. The switches are defined as follows:

#1,#2,#3, & #4 - Density select switches. These switches correspond to the power-up densities you would like assigned to the first through fourth disk drives on the AMDC (switch #1 --> first drive). OFF signifies double-density ON is single-density. If the AMDC is controlling Drive D1: (the boot drive), the default density will actually be the density of the diskette used to boot the system (the AMDC automatically adjusts to the booting density). These switches must all be OFF and Switch 8 ON for the 1050 DOS 3.0 compatible mode. In this mode, the AMDC will configure each drive to its diskette. This mode is intended for use with Atari DOS 3.0, and will NOT recognize 256 byte double-density diskettes. Factory setting for the densities is all OFF (double-density).

#5 & #6 - Switches 5 and 6 are used to select the starting address of the AMDC. The AMDC will respond to as many bus addresses (up to 4) as there are drives attached. The AMDC may be set to start at bus addresses 1 through 4. The switch settings are:

# 5	# 6	Bus Address
OFF	OFF	D1:
ON	OFF	D2:
OFF	ON	D3:
ON	ON	D4:

Factory address setting is OFF OFF for a starting address of D1:.

NOTE: The supplied modifications to DOS 2.0 will not allow more than four disk drives per system.

#7 - Switch 7 is the "MAP" switch. It is only useful in systems with more than two drives attached to the AMDC. When OFF, the AMDC will use externally attached drives as the lowest drive numbers on the controller, when ON, the 3" drives (assuming AMDC-II) are the first two drives. The most important use for this feature is when using an external 5.25" drive on the AMDC. If the map switch was OFF, and the controller address was to start at drive D1: then the 5.25" disk drive would be used as drive D1: to boot, and the 3" drives would be drives D2: and D3:. If the map switch was ON, then the 5.25" would be drive D3: and the 3" drives would be D1: and D2:(AMDC-II). The factory setting for the map switch is OFF.

#8 - Switch #8 sets the disk compatibility mode. In the OFF position, disks assigned double-density will default to 256 byte modified DOS 2.0 or DOS XL operation (180K byte operation). When ON, (and switches 1 through 4 are OFF) drives will configure themselves for 1050 compatible modes for use with DOS 3.0. **NOTE:** In the DOS 3.0 compatible mode, 256 bytes per sector diskettes will not be recognized and adjusted to. The factory setting is OFF for 256 byte per sector double-density

13.0 APPENDIX E - ALTERNATE DISK DRIVE CONFIGURATIONS

This section will present a number of examples of different system disk drive configurations. While it would be very difficult to show all possible configurations, these examples should give enough insight so that omitted configurations should be relatively simple to set up.

Before getting started, you should fully understand the AMDC setup switches which are located at the upper right rear of the AMDC. Of the eight switch positions, there are three in particular that you should be concerned with. These are switches 5, 6 and 7. Switch 7 is only used with external drives. Switches 5 and 6 set the STARTING address of the controller. The AMDC uses as many disk addresses as drives attached (3" and 5.25"). (**NOTE:** The addresses used are always consecutive numbers.) For example, if the switches were set to start at D1 and you had an AMDC-II with two 3" drives and one 5.25" drive, these drives would be D1, D2, and D3 respectively. Switch 7 decides which drive is FIRST in line on the controller. If 7 is OFF (UP) then the 5.25" drive (or drives) will be addressed before the 3" drives. If 7 is ON, the 3" drives are first. In any case the controller always starts at the address specified with switches 5 and 6. In the example above with 7 OFF, the 5.25" would be drive D1, the 3" drive labeled 0 would be D2, and the other 3" drive D3 (AMDC-II). With switch 7 ON the 3" labeled 0 would be drive D1, the next 3" drive D2, and the 5.25" D3.

Switches 5 and 6 settings are:

5	6	Start address
OFF	OFF	D1
ON	OFF	D2
OFF	ON	D3
ON	ON	D4

(NOTE: OFF is UP and ON is DOWN on the actual switches)

The Atari 810/1050 drive address switches are:

WHITE	BLACK	Drive address
LEFT	LEFT	D1
LEFT	RIGHT	D2
RIGHT	RIGHT	D3
RIGHT	LEFT	D4

(NOTE: The WHITE switch is BEHIND the BLACK switch)
(Refer to your Atari Disk Manual for switch locations)

13.1 SPECIFIC CONFIGURATIONS

Before changing any configurations, be certain the power is OFF to all disk drives, the computer, and all peripherals.

Attach all drives to your computer using the serial bus cables provided with the drives. It does not matter which order the drives are attached (drive D1 does not have to be the first in the chain). It is best to arrange your system in the most convenient manner to your useage, and then attach the cables to the drives. Use the above charts for the proper switch settings.

The AMDC may be used with any Atari compatible drive also. Please refer to your disk drive manual for the proper drive address switch settings.

A. Two 810/1050 drives and an AMDC-I or AMDC-II

1) Set one Atari drive for D1.
2) Set the other Atari drive for D2.
3) Set the AMDC to start with D3.

B. Two External Disk Drives and an AMDC-I or AMDC-II

1) Configure the two external drives according to Appendix G.
2) Set the AMDC start address to D1.
3) Set the AMDC Map switch (7) OFF (UP) to have the external drives addressed as D1 and D2. Set switch 7 ON (DOWN) to have the external drives addressed as D3 and D4 (or D2 and D3 when using an AMDC-I).

C. One AMDC, an External Drive and an Atari 810/1050 Drive

1) Configure the external drive according to Appendix G.
2) Set the AMDC start address to D1.
3) Set the AMDC Map switch (7) to OFF (UP) to address the external drive as D1.
4) Set the Atari drive to D4.

(The above setting uses the AMDC to control D1 so you have the advantage of automatic density recognition for the boot process).

The Atari drive may be used as D1:

1) Set the AMDC start address to D2.
2) Set the AMDC Map switch (7) to OFF if you want the external drive to be D2; ON if you want the 3" to be D2. (With an AMDC-I the external would be D3; AMDC-II the external drive would be D4).
3) Set the Atari Drive to be D1.

D. Two External Drives, an AMDC-I and an Atari Drive

1) Configure the external drives according to Appendix G.
2) Set the AMDC start address to D1.
3) Set the AMDC MAP switch (7) to OFF to have the external drive as D1; ON to have the 3" drive as D1.
4) Set the Atari drive as D4.

(The above setting uses the AMDC to control D1 so you have the advantage of automatic density recognition for the boot process).

The Atari drive may be used as D1:

1) Set the AMDC start address to D2.
2) Set the AMDC Map switch (7) to OFF if you want the external drives to be D2 and D3; ON if you want the 3" to be D2. (The external drives will be D3 and D4).
3) Set the Atari Drive to be D1.

E. Two External Drives, an AMDC-II, and an Atari Drive (Using More Than 4 Drives)

To use more than four drives the AMDC must control the drives with numbers greater than D4 (the Atari drives can only be set as D1,2,3 or 4). Using an AMDC starting at D4 you can attach up to seven drives to your Atari.

1) Configure the external drives according to Appendix G.
2) Set the AMDC start address to D2.
3) Set the Map switch (7) to OFF if you want the external drives to be D2 and D3 with the 3" drives as D4 and D5. Set the switch ON if you want the 3" to be D2 and D3 with the external drives as D4 and D5.
4) Set the Atari drive to be D1. (See Note on following page)

NOTE: The Atari drives will not do the standard double-density format so automatic density recognition will not be possible on boot up.

14.0 APPENDIX F - AMDC CABLES

To facilitate the use of external drives with the AMDC, the following cables are available as options from Amdek.

PART NAME	DESCRIPTION
AMD-2	Cable with 34 Pin Card Edge Connector to External Disk Drive
AMD-3	Cable with two 34 Pin Card Edge Connectors for use of two External Disk Drives
AMDS-1	Atari Serial Disk Drive Cable

15.0 APPENDIX G - USING EXTERNAL DISK DRIVES

When using the AMDC, one or two additional low cost 5.25" drives may be added to the system. These drives may be single or double-sided, 40 or 80 track drives. Double-sided and/or 80 track drives require DOS/XL Version 4 operating system to use the additional storage. Adding a single 5.25" disk drive to the AMDC will give access to any Atari compatible diskette at a reduced cost, and still give you the convenience and reliability of the 3" media.

15.1 Configuring an External Drive

WARNING: NEVER modify a drive's configuration with the power ON or plugged into the wall SEVERE SHOCK MAY OCCUR !!

NOTE: Both drive selection and terminator location are manufacturer specific. Please refer to your disk drive documentation for specific details in using your add-on drive.

To add external drives to an AMDC-I address the drive, per the manufacturers instruction, to be drive DS1 for the first external drive, DS2 for the second external drive, or DS3 for the third external drive. An AMDC-II can support two external drives setup as DS2 and DS3. (**NOTE:** While the Atari computer addresses the drives as drives 1 though 4 the disk drive manufacturer will call the drives 0 though 3. For example, DS 1 to the Atari is DS 0 on the external drive).

Disk drive termination should only be left in the LAST external drive on the cable (it will have to be removed if you are adding more than one external drive). The termination pack on a disk drive is usually located on the main PC board, and is normally situated near the cable edge connector. (FIGURE 4.0 depicts an example of the location of a terminator resistor on a disk drive)

It looks like an integrated circuit but is often blue or white-colored. It is typically the only socketed component on the board (some disk drives use a shunt block for drive addressing which is also socketed, but it looks more like small pieces of metal in a black plastic frame). To remove the termination pack, use a small flathead screwdriver and carefully pry it off. Attach a 34 pin edge connector to the disk drive(s) noting that the pin 1 of the cable (usually denoted with a red stripe) is aligned with pin 1 on the disk drive. The location of pin 1 depends on the manufacturer, so please refer to your disk drive manual. The other end of your disk drive cable must mate to the connector at the lower right rear of the AMDC. If your disk drive source does not have the proper cable, you may purchase one from Amdek. Section 14 (Appendix F) has a description of the cables available.

Attach the external drives 34-pin female connector to the 34-pin male connector on the rear panel of the AMDC unit. Orient pin 1 of the external drives towards the bottom of the Amdisk connector (which is pin one for the Amdisk drives).

Once the external drives have been attached the proper power-on sequence is :

A) Attach the AMDC to the computer using the bus cable provided.
B) Turn the power on to the external drive(s)
C) Turn on the AMDC, wait for external drives to be homed (2 to 3 seconds)

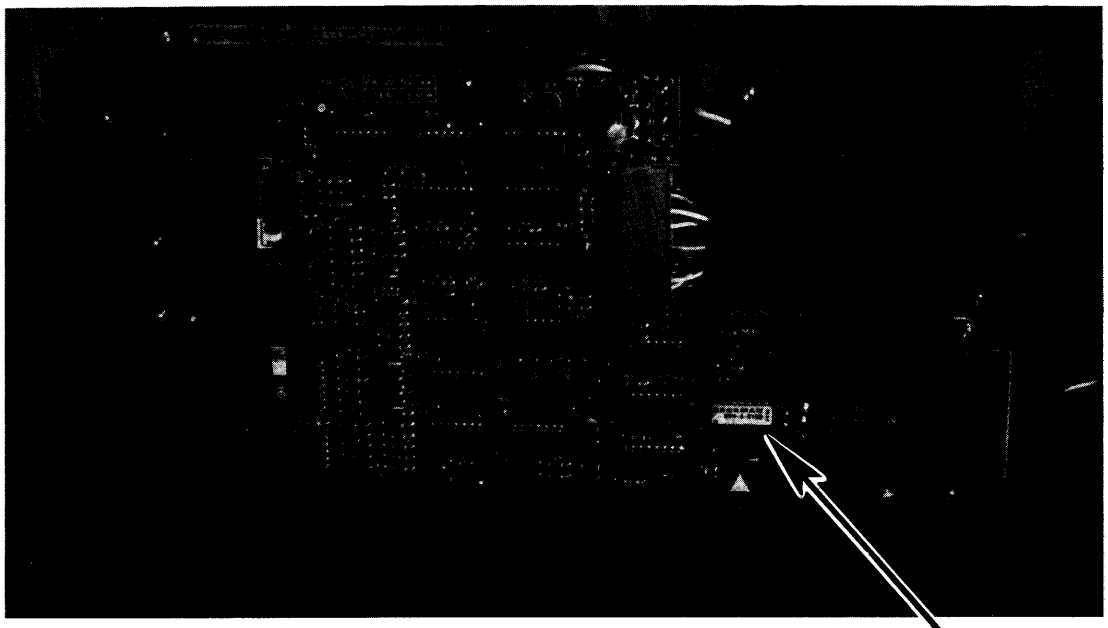
WARNING: If all drive select lights illuminate after powering on the AMDC, turn the AMDC OFF. This is an indication that the external drives are not connected properly (pin 1 on the connector is not oriented towards the bottom). Check the connections at the AMDC and on the external drives.

D) Insert a diskette into drive D1:
E) Turn on the Atari computer.

Section 9 on AMDC INSTALLATION and Section 13 (Appendix E) will tell you how to go about setting your system to the proper bus addresses. As configured from the factory, any external drives attached will be addressed before the microdrives. (If your previous setup was microdrives as drives D1: and D2: adding an external drive will shift the microdrive addresses to D2: and D3: and the external will be D1:).

FIGURE 4.0

EXAMPLE - TERMINATOR RESISTOR LOCATION



16.0 APPENDIX H - TROUBLESHOOTING GUIDE

If you have followed the installation instructions and the system does not work properly, the following information will help you define and isolate the problem.

First, be certain that all bus cables are installed securely, and that the bus cable attaches to the computer at some point in the chain. Check the power to the computer, the AMDC and all other peripherals. The AMDC's cooling fan will spin if power is supplied to the unit.

Next, make sure you are turning the power on in the correct order. **NOTE:** NEVER turn the power to the AMDC ON or OFF with a diskette in any drive controlled by the AMDC - this could damage data on the diskette. The proper sequence for turning your computer on is:

A) Turn the power on to the computer peripherals such as the disk drives (AMDC), printers, monitor.
B) Insert a diskette containing DOS into drive D1.
C) Turn on the power to the computer.

The computer should access D1 (the disk drive light will come on) and DOS will load into the computer, if not continue reading.

If you are using more disk drives than the standard AMDC (external drives or Atari drives), you should check the system without the AMDC and, if working, check it again with only the AMDC. This will help you determine if it is an installation problem or equipment failure.

Below are a number of symptoms and possible fixes:

A) Your computer works without the AMDC but not with it. (This procedure assumes you are using the AMDC as drive D1 WITHOUT any external drives).

1) The AMDC drive 0 LED does not illuminate

If the drive select light does not illuminate when you first turn on the computer, you have one of two problems. First, be certain that the AMDC rear panel switches are all OFF (UP), as this sets the AMDC bus address as D1. If they were not all UP, then remove any diskettes in the drives, turn the AMDC power OFF and then ON again, and retry the boot process. If it works this time, then your problem is just a switch setup problem - please refer to section 8 AMDC INSTALLATION. Second, if the switches are set correctly and you are certain that all cabling is installed properly, your problem may be a defective unit.

2) The AMDC drive 0 LED illuminates, the system will not boot

If the drive 0 light DOES illuminate, but you get a boot error when you turn on your computer, you may have a faulty diskette or you may be in the wrong operating mode. Switch 8 on the rear panel MUST be turned OFF (UP) to use the DOS XL diskette shipped with the AMDC. If it is not, remove the diskette from drive 0, turn the AMDC power OFF, set switch 8 OFF (UP), turn the AMDC power back ON, and try to reboot. If this does not work and your cables are installed correctly, you may have a defective diskette or AMDC.

B) Your computer works with the AMDC but not with your Atari drives AND AMDC.

Make sure you have checked the installation and drive address selection. If both the AMDC and Atari drive work separately, but not together, it is almost certain to be a setup or cable problem.

1) No drive turns on when you turn the computer on. This would indicate that neither the AMDC or the Atari drive are addressed as D1. Refer to the appropriate part of Section 9, AMDC INSTALLATION, for proper switch settings for both the AMDC and Atari drives.

2) If two drives turn on when you turn the computer on, then both drives are addressed as D1. Again refer to the appropriate part of Section 9, AMDC INSTALLATION, for the correct switch settings.

C) The computer works with the AMDC but not with the AMDC and external drives (attached to the AMDC).

Be certain that you have addressed the external drive hardware correctly (refer to section 15 APPENDIX H - Using external drives).

1) An external drive turns on at the same time as an internal (3") drive. This is an external drive hardware addressing problem. Please refer to section 15 APPENDIX H - Using External Drives and your disk drive manufacturers hardware manual for the proper external drive setup.

2) The AMDC appears to ignore the external drives. Be certain that you are using the proper power-on sequence when using external drives. You MUST turn the external drive power on BEFORE the AMDC power. The AMDC checks for external drives when you turn it on, so if the power is not on to the external drives, the AMDC will not see them and will ignore them.

3) Drive D1 is not where you think it should be. If you are using external drives and have addressed them properly, drive D1 may be assigned to the external drive(s) OR the 3" drives. Switch 7 on the rear of the AMDC decides which will be D1. If you want the external drives to be D1 the switch 7 must be OFF (UP) when you turn the AMDC on. If you want the 3" drive as D1, switch 7 must be ON (DOWN).

AMDEK
2201 Lively Boulevard • Elk Grove Village, Illinois 60007 • (312) 364-1180 • TLX: 25-4786